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# Controllable Synthesis of N-Doped and Dually Doped Mesoporous Carbons for Adsorption and Catalysis Applications

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## Abstract

Mesoporous carbon materials are being in vogue because of their intriguing properties and wide potentials. Doping of heteroatoms, especially N, in carbons have attracted enormous interests owing to its capability in enhancing or expanding their applicability in separation, energy conversion and catalysis. In addition, N-doping can further boost dually doped carbons, such as with S and metal as the second dopant. Such a dual doping could possibly optimize material property and maximize performance through synergistic effects. In this talk, several synthetic methods, such as post modification [1-2], one-step solvent-free nano-confining synthesis [3-4] and spray-drying-assisted assembly [5], for the synthesis of heteroatom (singly or dually) porous carbon materials with different porosities and structures will be introduced and discussed. Furthermore, the controllable synthesis of metal/heteroatom dually doped mesoporous carbons with desirable fascinating properties will be introduced. The demo-applications of these materials in typical adsorption, such as arsenic removal and $CO_2$ capture, and typical catalysis, such as oxygen reduction, biodiesel production and dehydrogenation/hydrogenation coupling reactions, will be presented and their structure-performance correlations will be discussed.

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